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ABSTRACT

A study examined educational adjustment (the personal and environmental compatibility with an educational program) and its relationship to several variables to which it is believed to be related. These variables included measures of satisfaction and satisfactoriness, several aptitude measures, and a series of demographic variables obtained from student records. Participants in the small validation effort were 96 students from a small, rural area vocational technical institute in central Minnesota in six different programs: all-female, all-male, and mixed-gender. Two questionnaires were developed for use: a student satisfactoriness (performance) questionnaire and a student satisfaction questionnaire. Results of analyses seemed to support the reliability and validity of the two constructs, satisfaction and satisfactoriness; the acceptance of the results of the canonical correlation analysis rejected the hypothesis that no relationship exists between the two sets of variables. A constructed measure of educational adjustment was also accurately described by the relationship between the satisfaction and satisfactoriness variables on a program-by-program basis. (Appendixes include data on factor/item relationships and factor loadings after varimax rotation.) (YLB)

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Pilot Testing a Model of School Adjustment for Postsecondary Vocational Education Programs

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Pilot Testing a Model of School Adjustment for Postsecondary Vocational Education Prorgrams

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Within the past decade, several conceptual models relating to attrition have been developed for students in institutes of higher education (Bean, 1980; Rootman, 1972; Spady, 1975; Tinto, 1975). These models have consistently indicated that students' levels of commitment to the educational institutions they are attending is a critical factor in determining whether or not students will continue to pursue their educations or drop out. The commitment variable is examined by aggregating data from several different aspects of students' lives, including their integration into the social and academic environments of schools. Several factors led the authors to conclude that none of the existing models used for higher education research were applicable to the study of student attrition from postsecondary vocational education programs. Nevertheless, the value of working from an attrition-related model is acknowledged by many researchers, including those examining attrition from vocational education programs. Yet, we have been unable to locate such a model which addresses this specific educational environment.

The purpose of this paper is to present a model of educational adjustment for students enrolled in postsecondary vocational programs. This model was developed as part of a larger

research effort by the University of Minnesota's Research and Development Center for Vocational Education (MRDC). That project focused on facilitating the transition of students needing special assistance into and through postsecondary vocational programs. Educational adjustment is assumed to be a condition that is reflective of students' perception of their satisfaction with their environment plus their instructor's rating of the students' satisfactoriness, or performance, in relation to a specific vocational program's rewards and requirements. Thus, educational adjustment is a concept that summarizes the person-environment fit relative to an educational program.

The rationale for this research approach has been summarized by Feldman and Newcomb (1969) who state that, "congruence between the needs, interests, and abilities of the student and the demands, rewards, and constraints of the particular college setting explains retention... and ...(T)he major research challenge lies in appropriately differentiating student and institutional environments and then empirically specifying the function that relates these two sets of variables to attrition" (p.65). Feldman and Newcomb's approach calls for measurements from the student's perspective, as well as from an external source, i.e., instructor. The present study employs such an approach by simultaneously gathering two sets of data. One set describes students' perceptions of their satisfaction with various aspects of their educational environment, while the other set measures students' performances in a variety of areas related

to the demands and requirements of their vocational programs.

This study, however, has examined only the psychometric characteristics of the two instruments used to measure satisfaction and satisfactoriness and has related those findings to the educational adjustment construct. The next logical step of relating these three constructs to student attrition is planned as a future project activity. Nevertheless, we believe that the conclusions derived from this study will have significant implications for future examinations of attrition in postsecondary vocational programs.

Background to the Present Study

This study evolved from a research effort begun in 1979 by the MRDC. That project focused on students' transition into and through postsecondary vocational education, with special attention to "special needs" learners who are typically classified as being handicapped, economically or academically disadvantaged, or limited English proficient (LEP). Special needs students often exhibit higher rates of attrition than their non-special needs counterparts. Counselors and admissions personnel from secondary and postsecondary vocational institutions were surveyed by telephone to examine this process in Minnesota, while a brief mail survey was conducted nation-wide. This investigation can be examined in Brown and Kayser, 1981 and 1982.

Development of the transition model. The major goal of the transition project was to develop and test a model of transition

processes. That model emerged in the form of an algorithm (See Brown & Kayser, 1982), and is based on concepts drawn from several different sources, such as vocational psychology (Dawis & Lofquist, 1969), health care service delivery (Perloff & Davidson, 1981), and rehabilitation case management strategies (Krantz, 1981). Transition is presumed to occur successfully when there is adequate correspondence between students' satisfaction with their educational environments and students' performance, or satisfactoriness, within their vocational programs. Furthermore, these two measures, which are assumed to be independent, can be combined to determine a level of correspondence in relative terms, i.e., high, marginal, or low. These levels are, thus, thought to represent students' levels of educational adjustment. Adjustment levels range from optimal to marginal to a level at which termination often occurs. Within the marginal range, students and the environment must "tolerate" each other if students are to continue their training. Thus, educators should know how to modify environmental conditions which cause students' dissatisfaction, while students should be assisted to improve unsatisfactory performance levels or encouraged to change other unacceptable characteristics. This relationship is depicted in figure 1.

Insert Figure 1 about here.

Theoretical Propositions

Several authors have encouraged researchers conducting attrition studies to include information relative to students' perceptions of their programs, as well as the traditional instructor ratings of students' performances. (Cope & Hanna, 1975; Feldman & Newcomb, 1969; Lenning, Beal & Sauer, 1980). Stock and Pratzner (1969) reviewed research in vocational education relative to predicting potential dropouts, and concluded that "aptitude testing is not the whole answer to the student selection/prediction problem... other variables, such as interest and motivation, act to influence student behavior in vocational education programs" (p.4). These statements tend to support the need to develop a model, such as the one discussed here, and to develop instruments similar to those used in this study. Based on this rationale, the following propositions are forwarded.

1. Student satisfaction can best be assessed by measuring student responses to a number of items that address several areas of their educational environment, including the school in general, their program, their instructor, as well as special services offered.

2. Measures of student satisfaction with sub-areas of the educational environment are better predictors of overall satisfaction than aptitude measures or student demographic characteristics.

3. Student satisfactoriness, or performance, can best be measured by an instructor's ratings of several sub-areas of

requirements related to educational programs, including ratings of maturity, general education skills, general performance in both laboratory and classroom work, and motivation (expressed in terms of attendance).

4. Measures of student satisfactoriness, based on the sub-areas listed in 3, are better predictors of overall satisfactoriness than aptitude scores or student demographic characteristics.

5. The measures of student satisfaction and satisfactoriness are likely to be independent. This proposition is based on the logic that each rater is viewing a different aspect of the person-environment fit and, thus, would result in relatively little redundancy of information.

6. By combining the results of both measures in a two by two contingency table, the resulting plot of cases should adequately represent the students in a program in terms of educational adjustment. This general description of educational adjustment should be verified by an observer with information about the students' perceptions and the instructors' perceptions respectively.

7. In regard to the educationally relevant variables which are under the control of educational institutions, the higher the correspondence between satisfaction and satisfactoriness, i.e., educational adjustment, the more likely student is to continue and complete their program. Conversely, the lower this correspondence, and consequently the level of educational

adjustment, the greater the need for tolerance by students and educational institutions.

8. Given levels of educational adjustment which call for increased tolerance, if neither the student nor the educational environment are able to improve the correspondence by changing the rewards or the performance, or by increasing tolerance, students are likely to drop out of programs or to be terminated. Propositions 1 through 6 are examined in this pilot study.

Literature Review

Hackman and Dysinger (1970) described three different routes to attrition. The first case is where a student is performing satisfactorily but experiences little commitment to either the school's goals or their own goals. In the second case, a student may be very satisfied with their relationship with the school and various people within that environment, but is not performing well enough to maintain their membership in the school. These persons are usually terminated by the institution. The third case consists of both low performance and low goal commitment. Hackman and Dysinger, however, do not suggest that a fourth possibility, high satisfaction and high performance, could also lead to attrition. For educators, this latter possibility appears reasonable since students are effected by such a wide variety of factors that no systematic effort could be mounted by schools to overcome their influence.

There is a persistent need in this field to develop adequate models that attempt to explain this phenomenon reliabily and

consistently (Lenning, Beal, & Sauer, 1980; Rootman, 1972; Spady, 1975; and Tinto, 1975). While these researchers have focused their attention at the college and university level, little has been developed at the postsecondary level for students in two year vocational education programs. Thus, much of this literature review focuses on research which addresses attrition in four year institutions.

Spady (1971) developed an early conceptual model which was based in part on a concept borrowed from Durkheim on social integration. Central to this model was the focus on the individual's background, both from a family perspective as well as previous educational experiences. These two factors were thought to "influence the individual's ability to accommodate the influences and pressures encountered in the new environment" (p.38). Spady also introduced the concept of congruence between the individual and the educational environment. Based on the assumption that individuals desire to become integrated into both the social and academic environment, and that students evaluate the rewards of that integration, it would then be possible to determine individuals' levels of commitment. While Spady assumed that several variables, including satisfaction, influenced levels of commitment, this latter variable was perceived to be the direct link to the decision to drop out. In a study conducted at the University of Chicago, Spady found that several variables were related to student satisfaction, including social integration, grade performance, and intellectual development.

Differences were noted between male and female students in three areas: a) decisions to drop out, b) commitment to the institution, and c) levels of satisfaction. In general, Spady found that women tended to rate certain intrinsic variables, such as quality of social integration, intellectual development, and faculty contact, as being more important than did men. Men, however, rated certain extrinsic variables, such as grades, as being more important than did the women. This study points out the importance of the different perspectives of the sexes when it comes to being able to account for reasons for dropping out of college.

Rootman (1972) also developed a model based on the concept of congruence. He began with over 200 different variables and through a process of reduction, developed a model using only eight variables that represented the degree of "fit" between the individual and the educational environment. This research was conducted at the U.S. Coast Guard Academy, which again is somewhat different than either a college or a postsecondary vocational setting. Rootman found that persons in his study who dropped from the program seemed to have inaccurate preconceived views about their environments. This discrepancy lead to a stressful situation among these cadets, and for those who were unable to revise their misconceptions, the lack of congruence was related to cadets' tendency to drop out of their programs. This finding is supported by several other researchers who also found that the relationship of the fit between individuals and their

environment is crucial in determining who stays and who drops out (Cope & Hannah, 1975; Feldman & Newcomb, 1969).

In another conceptual effort, Tinto (1975) developed a model incorporating two additional concepts that are related to the development of commitment toward an institution: a model of suicide (after Durkheim, 1961) and a cost-benefit analysis. Simply put, Tinto's model first examines the integration of students into the fabric of educational environments, both socially and academically. Based on this integration, students evaluate their positions relative to their perception of whether or not their present situations are worth the effort. Individual assess their present situation in light of other options, such as work or other schools. But according to Tinto, the continuous interactions between students and their environment tend to modify students' goals and commitments and, thus, lead to persistence or varying causes for dropping out.

Terenzini and Pascarella (1977, 1980) developed several measures to test these concepts. In their first report, they found that the factor which focused on interaction between students and faculty in social and academic areas, discriminated between dropouts and non-dropouts. Two variables which did not discriminate between these two groups were GPAs and involvement in extracurricular activities. In a later report based on a sample containing over 3,000 entering freshmen, these authors obtained several interesting findings. Those factors that differentiated between dropouts and non-dropouts are as follows.

1. The degree of social and academic integration experienced.
2. Differences in intrinsic versus extrinsic variables.
3. Informal student-faculty interaction (this factor accounted for most of the variance).
4. Integration into the academic area(often compensates for low integration in the social area, but the opposite seldom occurs).

Factors which did not differentiate between these two groups were primarily student background-related variables. These authors concluded that the most important determinant of voluntary withdrawal was the "influence of institutional policies, programs, or conditions that affect students after their arrival on campus" (p. 280).

This series of studies tends to suggest the following. First, background variables do not influence dropout behavior sufficiently to establish a crucial set of variables. Second, conditions which influence each student differentially after they are enrolled in school can be either social or academic factors. Third, social and academic interactions with faculty appear to be critical in the eyes of students who are deciding to withdraw form school.

Starr, Betz, and Menn (1972) have taken a slightly different approach to attrition. Their model is a modification of the Theory of Work Adjustment (Dawis, England, Lofquist & Weiss, 1964; Dawis, Lofquist & Weiss, 1968; Lofquist & Dawis, 1969). Starr, et al, reasoned that students who remain in college will

be more satisfied than those who drop out. Furthermore, they hypothesized that there are differences between those who drop out for non-academic reasons and those who are dropped for academic reasons. Their analysis compared a sample of 173 non-academic dropouts, 76 academic dropouts, and 151 non-dropouts. Grade point averages were the only measures of satisfactoriness, or performance, obtained. Their satisfaction questionnaire included five scales: a) compensation, b) social life, c) working conditions, d) recognition, and e) quality of education. Differences were noted between the groups on three of these scales, a), d), and e). These findings do not seem to support those of Spady and Tinto in regard to the influencing factors of satisfaction. Thus, it seems that further examination of this relationship is needed.

Summarizing the apparantly important variables noted in these studies, the following concepts are proposed as being important to attrition.

1. Congruence between students' perceptions of their environment and the actual conditions which they experience.

2. Differential influences as a result of experiences within institutions after students were enrolled, including the resulting social and/or academic integration.

3. Students appear to appraise their interaction with their environment in terms of effort expended plus present and potential return from their effort and, thus, are able to modify their goals and aspirations to some extent.

It appears, therefore, that the variables to be assessed should focus on specific aspects of students' interactions within school settings that are under institutions' control. In addition, specific variables related to students' performances within educational environments should also be assessed, so that many areas of inadequate student performance can enhanced.

Theory of Work Adjustment. The Minnesota Theory of Work Adjustment (TWA) has contributed substantially to this study. Those aspects of TWA that are incorporated into the model for school adjustment will be briefly reviewed here.

This model is one in which measures are taken of both the individual and the environment and can, thus, be called a person-environment "fit" model. In addition, the model is dynamic and developmental, in that it considers the recursive interaction of the two components. This conceptualization is succinctly elaborated in Dawis and Lofquist (1978) but a short description will be presented here.

When individuals enter work situations, they bring two important characteristics with them: a unique set of needs that seek reinforcement, and a set of abilities to be applied to the work demands. The environment also has two important characteristics which correspond somewhat to those of the worker. These include a set of reinforcers and a set of task requirements inherent in jobs. Ideally, there is a reasonable match between needs and reinforcers, as well as between the requirements of jobs and individuals' abilities. In reality, individuals' needs

may not be satisfied in job environment is and/or workers may not perform at the levels desired within work environments. According to Dawis and Lofquist (1978) these situations permit workers and/or job environments to display elevated levels of tolerance. However, if dissatisfaction with reinforcers, or the lack of satisfactoriness of performance exceeds a tolerable level, an adjustment mechanism is called for. This can be either of a reactive or active nature and if either of these mechanisms is able to enhance the level of tolerance, the individual is more likely to continue in the job environment. If, however, no adjustment mechanisms are employed, or they are ineffective, there is an increased probability that the individual will search for a different job where improved correspondence between person and environment can be attained. Many of these same concepts are adopted for the present model of educational adjustment.

Attrition studies in vocational education. Attrition from secondary and postsecondary vocational programs has been an important research area for many years (Mertens, McElwain, Garcia, & Whitmore, 1980; Stock & Pratzner, 1969). The vast majority of past research has been conducted using ex post facto designs employing multivariate analysis of readily accessible file data (Abshire, 1972; Goodman, 1975; Michlein, 1976; Parker, 1978; Stock & Pratzner, 1969; Terry, 1972). It is difficult to integrate an understanding of these studies because of the lack of a conceptual template by which comparisons can be made.

Consequently, the field is supplied with numerous reports identifying differencs and similarities, but little synthesis of the interrelationships of variables can be gleaned from these studies. Hence, only a short summary of the major findings from the vocational education field will conclude this literature review.

Stock and Pratzner (1969) reviewed numerous studies of vocational outcomes and made several conclusions. First, they noted that aptitude testing was not the principle means to predict student completion rates. While grades may be best predicted by entrance aptitudes, many other variables are instrumental in determining whether or not vocational students will complete their programs. Second, there is little evidence to indicate whether any policy or practice has been changed due to these diverse research findings. Third, these separate predictions are largely inefficient and generalizable results are scarce. Furthermore, Pershing and Schwandt (1980) state "that noncognitive predictor variables appear to be useful in prediction when the criterion is completion or persistence in the program" (p. 16).

Michlein (1976) supports this position based on the analysis of a four school (postsecondary) study in Wisconsin. One important finding was that students were very critical of the way they were treated by the staff. He also concluded that many of the dropouts had little understanding of the requirements of the programs they selected and that many of the students reported

receiving more unofficial counseling from their peers than formal counseling by school staff members. Finally, many of these dropouts reported that a lack of interest was instrumental in their withdrawal from their programs. These findings imply that administrators should reduce their reliance on aptitude test scores or other academic measures for predicting attrition. Michlein concluded that "measures of self-concept, i.e., career goals, commitment, confidence in ability, impression of the technical institute, and program understanding, all seem to be powerful in predicting dropouts"(p.23). However, these variables are not typically measured by most researchers. Mertens, et al, (1980) concluded that while the majority of studies reviewed reported high levels of satisfaction, only one study (Hall, Grey, & Berry, 1975) looked at specific aspects of the students' training program. These reviewers suggested that future studies should address details related to the satisfaction of vocational students (p.83).

In conclusion, while several conceptual models have been designed for use in institutes of higher education, they do not seem particularly applicable to postsecondary vocational schools. Furthermore, there presently are no conceptual models in use to guide research on vocational education student attrition. Most models and related research employ multivariate analysis because of the seemingly interdependent relationships between pertinent variables. Vocational researchers have also used this approach, although they typically have not used a model to guide their

efforts.

A different perspective of attrition has been briefly described in TWA (Dawis & Lofquist, 1978). Although the job-related focus differs from college or university environments, TWA is more closely related to vocational education programs. In fact, the concepts underlying this theory seem to be adaptable to efforts to examine attrition from vocational programs.

Little substantive information is available from prior research about postsecondary vocational education which can be used to build a model of school adjustment and attrition. That body of research can, however, provide information that can aid in the selection of variables pertinent to the constructs of educational adjustment and attrition. The following sections will examine the objectives, procedures, and findings of a small pilot study that addresses the constructs described in Figure 1.

Objectives of the Pilot Study

The major objective of this study was to examine a construct termed educational adjustment and its relationship to several variables to which it is believed to be related. Specifically, these variables included measures of satisfaction and satisfactoriness, several aptitude measures, and a series of demographic variables obtained from student records. The specific objectives and research hypotheses are enumerated below.

Objective 1: To determine the reliability estimates of the instruments designed to measure student satisfaction and student

satisfactoriness. This objective is an important first step in establishing the legitimacy of the educational adjustment model.

Objective 2: To determine the validity of the two measures of satisfaction and satisfactoriness. Although different types of validity were examined, including content, concurrent and predictive criterion, factorial, and construct, only factorial and construct are discussed in this report. Procedures used to evaluate these include examination of group differences, item intercorrelations, and factor scales and loadings.

Objective 3: To determine the degree of relatedness between the satisfaction and satisfactoriness constructs. The present model assumes that these two sets of information share little common variance between them. This relatedness was assessed using the Pearson product-moment and canonical correlation procedures.

Objective 4: To determine if a constructed measure of educational adjustment can be accurately described on a program-by-program basis by the relationship between the satisfaction and satisfaction variables. This required two procedures: a qualitative description of each program examined in the study and a second procedure which used data from the second round of data collection. These two sets of data were then compared and analyzed in terms of correspondence, and hence, the validity of the educational adjustment construct.

Research Hypotheses

In this study, primarily a validation effort, several research hypotheses seemed naturally related to the above

objectives. This study tested the following list of hypotheses.

Ho: 1, Assuming that the satisfaction instrument is valid, the scores from it should be able to discriminate between groups where known differences have been identified in previous research, specifically by sex of student and by different classes (or programs).

Ho: 2, Assuming the validity of Ho: 1, this instrument should not identify differences between students on characteristics not previously identified by previous research.

Ho: 3, Assuming that the satisfactoriness instrument is valid, it should discriminate between different characteristics of students where known differences have been identified before, such as by different grades and mathematics scores.

Ho: 4, The satisfaction instrument should not identify differences between students where such differences have not been identified previously.

Ho: 5, The scales from the satisfaction instrument will predict various satisfaction criterion variables better than student demographics, aptitude scores, or combinations of the two. In this case, the ability to predict is defined as the ability to account for the most variance in the criterion measures.

Ho: 6, The scales from the satisfactoriness instrument will predict various performance criterion variables better than student demographics, aptitude scores, or combinations of both. The definition of ability to predict as used in 5 above is used

here as well.

Ho: 7, There will be no statistical relationship between the measures of satisfaction and satisfactoriness.

These objectives and hypotheses comprise the rational for conducting this study. The methodological procedures and results follow.

Methodology

A small pilot study of the components illustrated in Figure 1 was conducted during the spring quarter of 1982 at a small, rural Area Vocational Technical Institute (AVTI) in central Minnesota.

Subjects. Prior to the collection of data, it was determined that a cross section of vocational programs should be selected. Thus, programs with the following characteristics were included in this study: a) an all-female program, b) an all-male program, and c) a program with a mixture of male and female enrollees. Consequently, six different programs were included in the study and a total of 96 students were studied. The student characteristics, by programs, are presented in Table 1.

Insert Table 1 about here.

The instructors who participated in the study were all certified vocational instructors and during this time period were part of a larger group participating in an inservice course designed to improve their skills to work with special needs students, i.e., handicapped, disadvantaged, and limited English

proficient.

Instrument development--independent variables. Two different questionnaires were developed for use in this study. Items for the student satisfactoriness (performance) questionnaire were developed with the active participation of the larger group of instructors, noted above. These instructors identified many attrition-related variables which were drawn from their personal experiences with dropout-prone students. These items were later analyzed and matched with their counterparts reported in the literature on dropouts. A second group of items that specifically addressed the performance skills needed in a variety of vocational programs were selected from a comprehensive list of generalizable skills developed and validated by Greenan and Smith (1981). The satisfactoriness questionnaire, containing items generated by the above process, was then submitted to a two person review panel at the MRDC for final editing. A list of these items is presented in Appendix A.

The content of the student satisfaction questionnaire was developed by identifying specific educational areas of student opinions regarding their personal satisfaction. These areas include: a) the school in general, b) the program enrolled in, c) their instructor, d) the support services available such as counseling and remedial assistance, and e) questions regarding their own performance. A special set of variables dealing with instructional activities is included that was adapted from a paper by Smith and Curry (1981, Note 1). This satisfaction

questionnaire was also submitted to the two person review panel for final editing. The list of these items from that protocol also appears in Appendix A.

Criterion variables. In addition to the independent variables described above, criterion questions were also included on each instrument, two on the student satisfaction form and four on the satisfactoriness form. These items were intended to provide a more global understanding of the attributes of satisfaction and performance, and were presented in a Likert-style format similar to that used for the independent variables.

The criterion questions for the student satisfaction protocol included the following.

1. I picture myself being employed in this vocational area, 1=never, 2=maybe, 3=probably, 4=for sure, 5=definitely.

2. My overall satisfaction with my program at this time is, 1=very satisfied, 2=satisfied, 3=dissatisfied, 4=very dissatisfied.

The four criterion questions for the satisfactoriness protocol consisted of the following items.

1. Rate this student's overall performance in your program at this time, 1=very good, 2=good, 3=average, 4=marginal, 5=poor.

2. How successfully has this student grasped the content of this program? 1=poorly, 2=marginally, 3=good, 4=very good.

3. What grade has this student earned in this course up to this time? 1=A, 2=B, 3=C, 4=D, 5=F.

4. Based on the student's present performance, rate the

likelihood that he or she is able to successfully master the skill and knowledge requirements of your program? 1=excellent, 2=good, 3=average, 4=marginal, 5=poor.
(Note that items 2 and 3 on the satisfactoriness questionnaire were included only during the last monitoring and can, thus, be considered as predictor criterion variables.)

Procedures. During the planning stages of this study, the authors decided to gather data with the two instruments at several intervals in the quarter. Thus, students were required to complete their forms twice, while the staff completed their forms on four different occasions. On two of these occasions, the staff and students completed the forms together, the first and third staff data collection cycles.

The data collected on these two forms were verified and transferred to data punch cards which were used to create a file for statistical analysis using Version 8.3 of the Statistical Package for the Social Sciences (Nie, Hull, Jenkins, Steinbrenner & Bent, 1975), on a Control Data Corporation Cyber-74 computer at the University of Minnesota, St. Paul.

Results

The results of this study tend to support the study's objectives and hypotheses. They also lend support to the general constructs of the model as far as the data permit. In this section, the objectives and hypotheses will be discussed together so that the logic underlying the development of the model and the study can be more clearly presented.

Objective 1 was to determine the reliability of the two instruments. Data presented in Tables 2 and 3 illustrate the internal consistency using Cronbach's Alpha. As can be observed from these data, the two instruments appear to be sufficiently reliable for research purposes.

Insert Tables 2 and 3 about here.

Objective 2 was to determine the validity of the two instruments, including factorial and construct. Content and concurrent criterion validity were also assessed in this study but are not be discussed in this section. Readers, however, should note that these additional validation findings were very consistent with much of the information presented below.

Factorial validity. In this study, a factor analysis was performed after the instruments' reliability levels were found to be acceptable. The tables of factor loadings for

both instruments are presented in Appendix B. The S.P.S.S. Factor program used the PA-2, principal factoring with iteration, and a varimax rotation, which is designed to simplify the columns, or the factors, of a factor matrix. Both of these procedures represent widely used and commonly accepted methods of factor analysis (Nie, et al, 1975, p.485). These factor matricies verify that items belonging to a logical group such as mathematics, or communication, load significantly higher on that factor than on any of the other factors. Few exceptions to this general finding were observed. However, in a case when an item formed a single factor scale, or when it loaded approximately the same on two factors, it was necessary for that item to be placed with the more logical of the two. These procedures were necessary for only 3 or 4 items in both instruments, and would not seem to substantially distort the factor meaning.

The factorial validity was determined by examining the structure of the factor loadings of each instrument. This process, also called convergent validity (Bean, 1980) is defined as "when all the factor loadings for the items in a particular scale are relatively high and fairly consistent"(p.162). Again, with the exception of those few items which were transferred from another factor, this criterion seems to have been met successfully. The relationship between the factor analysis and the internal consistency analysis in support of these instruments'

validity levels are presented in Tables 4 and 5.

Insert Tables 4 and 5 about here.

Predictive criterion validity. Two types of criteria were assessed in this study. The first consisted of a set of criterion variables placed on the instruments as the independent variables. That is, several global questions focusing on the general areas of satisfaction or satisfactoriness were included on these instruments. These criterion variables were used in a multiple regression analysis (MRA) with several different predictors, including the scales for these instruments, student demographics, student aptitude scores on three locally developed tests, student sex, and program classification. Because of the large number of variables and the relatively small sample size, only aggregate data are reported. Tables 6 and 7 present the results of tests for Hypotheses 5 and 6. To recapitulate, these are:

Ho: 5, The scales from the satisfaction instrument will predict various satisfaction criterion variables better than either student demographics, aptitude scores, sex, program classifications, or combinations of these.

Ho: 6, The scales of the satisfactoriness instrument predict various performance criterion variables better than student demographics, aptitude scores, sex, program

classifications, or combinations of these.

Tables 6 and 7 show the comparisons of relative amounts of variance accounted for by the independent and modifying variables taken together. That is, the coefficients used in calculation of the equation are partial coefficients.

Insert Tables 6 and 7 about here.

The data presented in Tables 6 and 7 illustrate the amount of variance accounted for in the criterion variables by different combinations of independent and modifying variables using a full regression model with all predictor variables included, and various reduced models. Three observations are of interest here. First, the amount of variance accounted for in the concurrent criterion variables is the largest, especially given the scales from the respective sub-scales of the two questionnaires. The amount of variance accounted for in the two predictive criterion variables was somewhat less but still substantial. Second, the R-Squared value for the variable "pictured being employed" was the lowest of all indicating that it was a poor choice of a criterion. We can only speculate about this, but it may be related to students' perceptions that future conditions are not dependent upon their present levels of satisfaction with their programs. Third, the amount of variance in all criterion variables which is

accounted for by the instruments sub-scales is significantly greater than any combination of other variables. Hence, these results tend to validate the model described in Figure 1.

Furthermore, these data and their patterns tend to support the acceptance of Ho: 5 and 6 noted above. Data for the Satisfactoriness questionnaire and the criterion variable of "Grade in Course" strongly support the previous conclusions by Stock and Pratzner (1969) that non-aptitude variables will more adequately predict criteria other than grades.

Construct validity. This form of validity is defined as the extent to which an instrument measures the underlying construct for which the items are thought to be proxy indicators. Since a construct can not be measured directly, proxy measures of the construct are used and the results are examined in relation to the hypotheses and assumptions of the construct. If these proxy measures respond in a positive manner as expected, then one can assume that they measure the construct under examination (Nunnally, 1967). Our examination of construct validity is based on several different analyses of the data.

Guilford (1948) has argued that exact and stable descriptions of a test's contents can be obtained via factor analysis. Furthermore, because this method provides economical explanations, the process can be used to predict

complex human behaviors. The results of our factor analysis are presented in the factor matricies located in Appendix B. The findings indicate that the items are clustered into logical groups or factors, upon which the instruments' were initially developed. Furthermore, the items in these factors all had loadings of significant strength to reinforce their importance within a particular factor. The factor analysis results presented in Tables 4 and 5 tend to support the construct validity of both instruments.

Construct validity was also evaluated by examining the internal consistency of the measures. According to Cronbach and Meehl (1955), if the underlying theory of the trait being measured calls for high item correlations, then these would tend to support the presence of construct validity. In the present model, it is assumed that aspects of an individual's satisfaction and satisfactoriness will tend to become more stable as time passes. That is, given that an individual has managed to remain in school for several months, it is assumed that students have also achieved an initial level of correspondence within that environment. Thus, during the relatively short period of time between the two data collection efforts, little change in measured levels was expected. Hence, it was assumed that: a) correlation levels on given scales over time will be relatively high, b) the intercorrelations of scales at any one time will be of low to moderate strength, but c) these

intercorrelations of scales over time will be very stable. Tables 8 and 9 show the results of these three analyses. The satisfactoriness instrument analysis from Table 8 will be discussed first.

Insert Tables 8 and 9 about here.

The correlations presented in Table 8 are to be read as follows. On the main diagonal are the correlations of the respective scales A through G, between the third and fourth data collection times. These show significant levels of association over time. The upper right triangle is composed of intercorrelations of the seven scales from the third data collection period, while in the lower left triangle, are the scale intercorrelations from the fourth data collection. (Although we do not present the same results from cycles one and two, we assure readers of their similarity to the data presented in the present discussion) Based on the assumptions listed above, these values tend to support the concept of construct validity based on the scale correlations over time. However, it should be noted that scale intercorrelation values are somewhat higher than might be expected, unless all scales were measuring the same thing. Examining the construct of satisfactoriness, this finding would probably be more acceptable than one which reported values ranging from high to low. These moderate

intercorrelation levels suggest that each scale in the instrument is of like importance in the eyes of this particular set of instructors.

Table 9 presents the correlations and intercorrelations from the two student monitoring cycles. The logistics of the data values are the same in Table 8, except for time one scale intercorrelations are in the lower left and for time two in the upper right. It can be observed that the values of the scale correlations over time are moderate to high and all statistically significant. However, the intercorrelations of these six scales show more variance than the values of the satisfactoriness instrument, with values ranging from moderate to negligible. Yet, these values are quite similar for both occasions indicating that the process tends to be relatively stable.

Interpretation of the results generated by the student questionnaire scales suggests that they are measuring different aspects of student satisfaction but are relatively consistent over time. Although the data indicate that the influence of the instructor is considerable for these students and support similar findings by Tricket and Moos (1974), they also show that the instrument is tapping other sources of variance operating within this relationship. Hence, this pattern of correlations and scale intercorrelations support the assumption that the concept of satisfaction as being composed of several different aspects

of the student's life.

A final test of construct validity was an examination of the instrument's ability to discriminate between levels within groups where known differences have been identified by past research, and/or logic. Only a few student charactstics were found in the literature which pointed to differences of satisfaction between classifications of individuals. One such important area was the gender classification (Bean, 1980; Starr, Betz, & Mann, 1972). For the satisfactoriness scale, students' scores are assumed to be based on their course grade, and possibly based upon their age. Pucel, Nelson, & Wheeler (1971) also found differences between groups of successful and unsuccessful vocational students categorized by their math scores. Table 12 presents an analysis of the differences of students' total scores on both questionnaires. These data are used to test hypotheses 1, 2, 3, and 4, which state the following.

Ho: 1. The scores of the satisfaction instrument should be able to discriminate differences between groups where known differences have been identified in previous research, specifically by sex of student and by their program.

Ho: 2. The scores from the satisfaction instrument should not identify differences between students on characteristics not previously identified in the research.

Ho: 3. The scores of the satisfactoriness instrument should be able to discriminate between different

characteristics of students where known differences have been identified in previous research, such as by different grades and mathematics scores.

Ho: 4. The scores from the satisfactoriness instrument should not identify differences between students where such differences have not been previously identified by the research.

Insert Table 10 about here.

The results shown in Table 10 tend to support Ho: 1, and 3, but identify more differences than were expected. Hence, Ho: 2 and 4 are not supported by these data. For the first hypothesis, both expected conditions were identified. However, in regard to the second hypothesis, the data indicate that students differed in terms of their total satisfaction scores based on: a) differences in their highest grade achieved, b) the grade they were receiving in the course, and c) differences in the number of times the student left the class early, i.e., before it was officially over. One could argue that these three results might logically be expected, but considering their F values are just beyond the .05 level of significance, it might suggest that these results are due to the sampling strategy used for this study.

Under the column for the satisfactoriness instrument in

Table 10, the two areas predicted in the third hypothesis were found as expected, i.e., math, and grade in course. Thus, we can tentatively accept Ho: 3. But for Ho: 4, we find several differences in relation to the students' commitment as defined as measures of attendance, tardiness, leaving early, and arriving late from breaks. Furthermore, there were differences noted by classification of marital status, with the single group getting the poorest scores. These findings do not seem out of place in this study, and in fact appear to be logical expectations for this population of students. Thus, while we will reject hypothesis 4 because similar findings have not readily appeared in the research literature, an argument can be made for their appearance.

To summarize the validity section, there appears to be sufficient evidence that the satisfaction and satisfactoriness instruments exhibit acceptable levels of validity for research purposes.

Objective 3 was to determine the degree of relatedness between the two constructs of satisfaction and satisfactoriness. This is an important relation, especially in terms of how these two constructs relate to the broader construct of educational adjustment. Based on the schema of Figures 1, it is assumed that these two constructs are relatively independent of each other. If this assumption is true, the satisfaction and satisfactoriness constructs

provide different types of information relative to educational adjustment. Thus, we can phrase our statement in the form of a null hypothesis, as follows. Ho: 7, there will be no statistical relationship between the measures of satisfaction and satisfactoriness.

In order to test this hypothesis, two separate correlational tests were conducted (Table 11). The first analysis used a Pearson product-moment correlation process to test the overall relationship between the total scores of the two instruments. The second employed a canonical correlation using the scales of one instrument with the scales of the other instrument. This procedure was employed in other research on instruments thought to be independent and consisting of several scales which were completed by two different raters (Weiss, Dawis, Lofquis & England, 1966).

Insert Table 11 about here.

Table 11 shows that when the total scores from both instruments are related in a standard Pearson product-moment analysis, the relationship indicated independence. Based on a correlation of .114, and a sample size of 96, the result is not significant at the .05 level. However, the canonical correlation analysis did not support this assumption of independence. This latter analysis returned six canonical roots, of which only the first one had a moderate level of

correlation, r =.59, indicating that 33 percent of the variance for one set can be explained by a linear combination of the other. Interpretation of these two analyses places some doubt on the independence of the two constructs. However, based on the previous arguments regarding the need to examine various facets of students' perception of satisfaction with their environment, and the argument that grade point averages leave much to be desired in describing students' performances in programs, the canonical correlation seems to be the most appropriate analysis to use in this situation (See Weiss, et al, 1966, p.37). Thus, we reject the hypothesis that no statistical relationship exists between the two constructs.

Objective 4 was to determine if a constructed measure of educational adjustment can accurately be described by the relationship between the satisfaction and satisfactoriness variables, on a program-by-program basis. Two procedures were used in developing this objective. In the first procedure, data received from the first data collection session where shared via a feedback session with each group of students on an individual class basis. This feedback of initial data during an average 30 minute discussion with the students allowed the authors to develop a clear picture of students' satisfaction levels. The same procedure was used with all instructors, obtaining clarification of the averages reported on the satisfaction questionnaires. These

activities allowed the authors to develop a better understanding of the person-environment relationship for students in all programs. This information enabled the next step in this analysis to be implemented.

The next step was to compare the results from the second data collection session to be compared with the results of the first collection cycle. The time interval between these two steps was approximately six weeks. For this analysis, the total scores from both instruments were used. Since the distributions of these two instruments approach a normal distribution, (Table 12), the distribution was dichotomized along the .95 confidence interval (CI) for both, which generated "high" and "low" groups for both distributions. The logic for using the .95 CI is based on the fact that these instruments are not perfect measurement devices, thus, a wider range of persons was included in the category of "high" for both variables. In addition, the studies reviewed by Mertens, et al, (1980) confirmed the general finding that the majority of students rated their experiences as very satisfied. Hence, it is logical that numerically more students are assigned to the high category. (We must note that a low score indicates more satisfaction or better performance, while a high score indicated lower satisfaction or performance). Using the high point of the .95 CI, the researchers assumed that students with scores lower than that point could be considered to be highly

satisfied and to be performing well, while those above that cutoff could be considered low on each of the scales.

Insert Table 12 about here.

Both data and feedback information from the first data collection provided a clear description of the student-environment fit in these six programs. Three of these programs had rather special profiles, while the remaining three could be described as being average. Of the programs with special profiles, Program 2 was decidedly positive, where both students and instructors indicated high degrees of satisfaction and satisfactoriness respectively. Another program, Program 5, showed quite the opposite condition, where students were outwardly complaining about several aspects of their program. In that program, the instructor also described problems with students in general. Indeed, this program's average scores on many of the subscales from both questionnaires were the most discrepant of all programs. Finally, a third program, Program 1, displayed two different groups of students, one which expressed dissatisfaction with their program while the other were relatively satisfied. However, this instructor informed us all these students were performing at least at average or higher levels.

The data from the second collection period were then

placed into separate two-way contingency tables, one for each program. These tables are presented in Figure 2. Comparing these results to those descriptions presented above, two of the three "average" programs tend to show similar results in the second data set. That is, most of the students in programs 3 and 4 are in the high range of both satisfaction (rows) and satisfactoriness (columns). Program 6, the third "average" program from the first monitoring showed a slight positive change for the second monitoring. However, the three unique programs described above had comparable results for the second monitoring period as illustrated by the results of the contingency tables. That is, the profile of program 2 parallels the description obtained after the first monitoring, where students were both highly satisfied and performing well. Program 5's profile on the contingency tables clearly demonstrates the lack of correspondence between satisfaction and satisfactoriness for the majority of these students. The profile of Program 1's students also reflects the earlier results where students expressed mixed perceptions of satisfaction, but were rated as performing satisfactorily.

Insert Figure 2 about here.

The information presented in the contingency tables in Figure 2 represent a rather crude measure of the

person-environment fit for students in six different vocational programs in one postsecondary vocational institution. Since this model is in an early developmental stage, the primary concern was to identify sub-areas of the two constructs of satisfaction and satisfactoriness that could be measured while students are still enrolled in their programs. The items and the sub-scales of these two instruments appear to have this desired quality. Hence, we can safely state that these instruments show positive indications of being valid.

Discussion

The purpose of this paper was twofold: to present a conceptual model of educational adjustment for students in a postsecondary vocational setting and to describe data from a pilot study which examined concepts of satisfaction and satisfactoriness. This construct, educational adjustment, was said to be a functional relationship of measures of satisfaction and satisfactoriness, and these latter two constructs were operationalized as being measures on two instruments designed specifically for this study. It was predicted that these two scales would perform in specific ways, as described by several objectives and hypotheses. Overall, there seems to be sufficient evidence from this pilot data to tentatively support most of them, specifically regarding reliability and validity. However, since our sample size was rather small, the findings should be viewed

as only being exploratory. The following highlights are presented.

Objective 1, which was to determine the reliability of the two instruments seems to be satisfactorily met. There appears to be sufficient cause to believe that these two instruments possess internal consistency, test-retest reliability for the total scores, for each scale, and for the instruments by scales, i.e., using canonical correlation.

Objective 2 was to determine the validity of the two measures. Several different tests, procedures, and analyses were used to explore the inferences of validity for these instruments. Based on the results of these analyses, we are confident that these results establish acceptable levels of validity for these two instruments for research purposes.

Objective 3 was to determine the degree of relatedness of the two constructs, satisfaction and satisfactoriness. It was originally assumed that there would be little shared variance between these two measures because they were completed by two different raters, and based on two different psychological constructs. However, using different analyses produced different results, one supporting the hypothesis and one rejecting it. Accepting the results of the canonical correlation analysis, which seems to be the most logical approach, rejects the hypothesis that no relationship exists between the two sets of variables.

Objective 4 was to examine the relationship between the two measures of satisfaction and satisfactoriness and a constructed variable of educational adjustment. This was accomplished using two different procedures, one which combined data collection, data feedback to students and staff along with discussions with these groups, and the second, a comparison of the qualitative data with quantitative data. These results provided descriptions of classes which were verified through descriptive comments and observations of these classes by the authors.

Limitations and Recommendations

It must be recognized that this paper and pilot data represent a conceptual model in its infancy. While there appear to be valid and important concepts addressed here, a considerable amount of work still remains to link the model to the more substantial criterion of attrition and retention, which was not undertaken in this study. Specific limitations and recommendations related to the model and the study include the following.

1. Sample size. While the total sample of this study was necessary for certain multivariate statistics, a much larger body of subjects will be necessary in the future. However, this presents a problem in that we found significant differences in student satisfaction between classes. Given that, many vocational classes are limited by the number of work stations available at any one time, usually 30 or less,

the potential for developing large samples that can be subjected to multivariate analysis procedures is limited. Hence, there is a greater need to examine many different classes, or programs, to determine if the current findings can be verified.

2. Wider base of subjects. The sample contained only Caucasian students. This was an inherent limitation of the school setting from which the data were obtained. In addition, this setting was rural in nature and future studies should include both urban and suburban settings, as well as a multicultural base.

3. Criterion variables. One analysis in this study showed the limitation of one of the satisfaction criterion variables that was initially assumed to be important. In future work, criterion variables must be given additional thought, especially when identifying those which can be considered more concrete and relying less on questions in written form, unless there is a specific time interval between measurement of the independent and the criterion variables.

4. Measurement of educational adjustment. Perhaps the weakest link of the model at this time is the measure of educational adjustment. While one assumption called for a constructed variable, it is critical to discover a measure of that construct in the form of the person-environment fit model.

5. Effects of intervention. In order to more fully understand the three constructs, a test or procedure should be developed to attempt to change adjustment levels. That is, by applying an intervention for students assumed to be marginal or low on educational adjustment and then observing the results. There are numerous suggestions in the form of specific items for both of these instruments for such an intervention. Since the model appears to limit the use of large samples of subjects, the use of intervention strategies with individual classes would appear to be a useful strategy for developing a deeper understanding of this relationship.

Conclusion

This paper presented a new model of school adjustment for vocational education students along with pilot data which examined several aspects of the model. The model and the results presented herein must be considered only preliminary work. Several of the model's concepts and assumptions seem to be supported, while others were at best, weakly supported. The assumption of non-relatedness of the instruments used in this study was not supported. Yet, the resulting profiles of the data from both instruments provided an adequate description of the six classes involved in this study. However, the overall results provide some encouragement to continue the pursuit of understanding educational adjustment, and attrition, based on the

conceptual model presented here.

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APPENDICES

A: Student Satisfaction Questionnaire, Factor/Item Relationahip

Student Satisfactoriness Questionnaire, Factor/Item Relationship

B: Factor Loadings After Varimax Rotation-Student Satisfaction

Factor Loadings After Varimax Rotation-Student Satisfactoriness

Appendix A (1)

Satisfaction Questionnaire

Factor/Item Relationship

Factor Loading	Scale	Item #	Wording
.673	E	6	How often are you absent from class
.568	E	7	How often are you late to class in morning
.559	E	8	How often do you leave class early
.480	A	9	This is how I feel about counseling avaliable to me before I selected a program
.559	A	10	This is how I feel about rules and regulations in this program
.491	D	11	This is how I feel about support services available to me
.786	D	12	This is how I feel about student activities available to me
.772	D	13	This is how I feel about school functions available to me
.522	A	14	This is how I feel about the friendliness of the staff toward new students
.401	A	15	This is how I feel about help available to students selecting career goals
.369	A	16	This is how I feel about job search and job preparation activities
.776	A	17	This is how I feel about the instructor's concern for me as an individual
.779	A	18	This is how I feel about the career counseling given to me by this instructor
.512	A	19	This is how I feel about my satisfaction with the program I selected
.793	A	20	The variety of teaching aids and methods used in class
.446	A	21	My opportunity to practice these skills outside the class or shop/lab
.906	A	22	This is how I feel about the way the instructor organizes the program content so I can learn easily
.879	A	23	Puts the material in order so material in one unit is related to material in another
.816	A	24	Takes into account my ability to learn new material
.813	A	25	Tells me about what I can expect this course to be about
.798	A	26	Adjusts the speed of the instruction which is given to me
.839	A	27	Plans practice sesions for the material learned in the classroom or shop/lab
.757	A	28	Rewards me when I do good work
.721	A	29	Keeps me informed on how well I am doing in this program
.144	F	30	This is how I feel about my interaction with other students
.670	A	31	This is how I feel about my interaction with instructors and administrators
.549	F	32	This is how I feel about my attitudes and habits toward safety practices

Appendix A (continued) (2)

Factor Loading	Scale	Item #	Wording
.796	F	33	This is how I feel about my respect for tools and equipment in my program
.822	C	34	This is how I feel about my effort to complete classroom work
.789	C	35	This is how I feel about my effort to complete shop/lab work
.736	C	36	This is how I feel about accepting responsibility for my own learning
.730	C	37	This is how I feel about my work pace in the classroom
.672		38	This is how I feel about my work pace in the shop/lab
.622	A	39	This is how I feel about my overall attitide toward this program
.510	A	40	This is how I feel about my overall motivation in this program
.713	C	41	This is how I feel about my overall performance in this program
			Rate how well you do in each of the following:
.556	B	46	Basic mathematics skills
.736	B	51	Communication skills
.717	B	58	Interpersonal skills
.740	B	63	Physical skills
.642	B	69	Reasoning/thinking skills

(3)

Student Satisfactoriness Questionnaire
Factor/Item Relationship

Factor Loading	Scale	Item #	Wording
.387	B	20	How much supervision/criticism does this student require ona day to day basis
.424	B	21	How mature does this student appear to be
.571	E	22	Does this student appear to get along satisfactorily with other students
.845	E	23	Does this student appear to be satisfied with their chioce of training program
.713	E	24	Does this student appear to want to complete the entire training program
.648	E	25	Does this student appear to get along satisfactorily with staff and administration
.741	E	26	Does this student appear to understand the volumne of the content present in this program
.217	C	27	Does this student appear to participate in student activities or school functions
.554	E	28	Does this student appear to have clean and well defined vocational goals
			How satisfactory is/are the
.710	C	29	classroom work habits of this student
.631	C	30	shop/lab work habits of this student
.530	C	31	students' attitude toward his/her program
.572	C	32	students self image in relation to this training program
.742	C	33	student's work pace in the shop.lab
.749	C	34	student's work pace in the classroom
.488	C	35	student's attitude/habits about work safety
.685	C	36	student's own acceptance of responsibility to learn the contents of this program
.577	C	37	students adjustment into the routine of this class compared to other successful program completion dose/structure
.755	G	38	miss class (more-less)
.815	G	39	return late form breaks (more-less)
.855	G	40	leave class early (more-less)
.895	G	41	come late to class (more-less)
			Rate this student's performance in the following areas:
.933	F	46	basic mathematic skills
.775	F	47	working with whole numbers
.867	F	48	fractions, decimals, percents
.804	F	49	working with work problems
.730	F	50	linear, weight, volumne measurements
.788	D	51	communication skills
.718	D	52	complete and accurate sentences
.733	D	53	uses correct words in writing and speaking
.566	D	54	finds information using references or dictionary
.689	D	55	organizes thoughts in writing and speaking
.561	D	56	reads forms, charts, letters, manuals, tables
.746	D	57	writes correct orders, letters, forms

(4)

Student Satisfactoriness Questionnaire
Factor/Item Relationship (continued)

Factor Loading	Scale	Item #	Wording
.588	A	58	interpersonal skills
.472	A	59	accurate listening and speaking skills
.481	A	60	follows instructions accurately, completely
.573	A	61	gives clear, accurate directions
.521	A	62	displays positive manners of sharing, helping and cooperating
.904	A	63	psychomotor skills
.893	A	64	grossmotor, moving about, lifting, tearing
.895	A	65	upper body, pull, push, reach, handle
.780	A	66	fine motor, finger feel, position, adjust
.791	A	67	eye-hand coordination, judgement, accuracy
.799	A	68	learn from trial and error
.440	B	69	reasoning and thinking skills
.735	B	70	selects appropriate materials, methods, equipment and procedures for a task
.677	B	71	determines goals and activities to complete a job
.632	B	72	estimates time, priorities, activities required to complete a job
.782	B	73	accurately relates causes to problems and selects logical soluctions
.600	B	74	accurately uses questions to pinpoint problems
.732	B	75	ability to recall recent instructions, directions
.748	B	76	ability to recall instructions, procedures over long periods of time

(2)

Factor Loadings After Varimax Rotation

Student Satisfaction

Variable	Factor 1	2	3	4	5	6	7	8
28	7577	1968	-1483	1944	-1047	-0179	0331	-1478
29	7217	2062	0630	1954	0641	-0256	-0071	0275
30	3426	1955	0814	3159	-0060	0435	1449	2171
31	6703	2677	0674	3175	0345	-0266	0131	1575
32	1662	2502	3327	1169	1647	-0148	5498	1223
33	1006	3315	1271	1171	-0350	0900	7967	-0936
34	0922	8228	2169	-0098	0833	1291	1307	-1170
35	1349	7895	1640	-0835	1212	0044	2180	0382
36	1700	7367	2453	-1351	1024	-0213	1479	1407
37	3057	7303	0106	-0512	-0111	0081	0687	-1020
38	3460	6723	-1269	0427	0346	0730	2310	-0956
39	6221	4852	0318	1366	1160	0459	-1155	4018
40	5100	5690	0566	1922	0766	2353	-0546	3996
41	3013	7133	0074	1131	1755	0406	-0926	2670
46	0261	0239	5568	-0340	-0510	2234	-0611	-2450
51	0687	0509	7266	0181	0751	-0444	0789	1559
58	-0269	0660	7174	1133	0546	0958	1663	0047
63	0237	0721	7409	0179	-1122	-1594	-0649	-0111
69	-1181	2127	6423	0570	-0090	-0693	1263	0289

(3)

Factor Loadings After Varimax Rotation

Student Satisfactoriness

Variable	Factor 1	2	3	4	5	6	7	8
20	-0704	3870	5030	2570	3030	2438	1857	1756
21	1333	4241	2034	1559	0851	2982	2726	1489
22	1193	1640	0894	2155	1685	5712	059	2114
23	1828	2246	0102	2301	1091	8450	0495	-0630
24	0214	1601	0898	0406	-0004	7195	0388	-0429
25	2236	0504	0135	0752	0735	6480	0563	1469
26	1320	2899	1532	2329	1589	7414	1510	-0925
27	-1522	1459	2170	-0741	0741	0945	-1867	1159
28	0471	2654	3227	1626	1740	5549	1087	-0071
29	2783	2184	7100	1320	2453	0931	2770	-0199
30	2655	3311	6319	0524	2007	1208	2361	-0129
31	4209	2079	5303	1839	-0507	2243	3087	-1599
32	3633	1392	5725	2500	-0252	0654	1071	-1100
33	0624	3494	7423	1404	1594	0290	1716	1587
34	0665	2040	7496	1978	2796	0481	1258	0883
35	5591	2057	4885	3115	-0294	0284	2461	-0024
36	1934	2081	6851	2264	1063	1676	1889	0186
37	4106	1882	5777	2409	0391	1314	2762	0812
38	0237	0129	3302	0930	0206	0959	7558	1174
39	1207	1490	1891	0470	1584	1338	8157	0138
40	2462	1351	1100	1076	0551	0654	8558	-0597
41	1397	1445	2139	0678	0726	0753	8952	-0053

Note: Decimal points omitted

(4)

Factor Loadings After Varimax Rotation

Student Satisfactoriness

Variable	Factor 1	2	3	4	5	6	7	8
46	0666	1686	1405	1603	9334	1553	0345	0401
47	-0459	1619	2285	1487	7759	2888	0953	-0537
48	0862	1912	1988	1818	8674	1833	0696	0027
49	2637	1387	0692	2394	8041	0366	0082	0264
50	0096	-0067	0460	0972	7308	-0485	0728	0423
51	2664	2749	1994	7881	2610	2264	1317	-0291
52	1171	3099	2774	7189	2408	2014	0724	0300
53	1529	2659	2639	7334	1968	2397	0390	0323
54	3772	3329	0748	5663	3527	1589	1639	0520
55	1400	3462	2908	6890	2285	2124	1369	0946
56	4045	3755	0418	5614	1728	1829	1773	0143
57	2482	3175	2217	7466	2992	1665	0708	0545
58	5880	3600	3095	3806	0982	2347	0076	3624
59	4728	3489	2771	3955	0555	2138	1152	4311
60	4813	4900	3002	2286	1419	2200	0840	3822
61	5738	3711	3111	3874	0964	1768	0410	3363
62	5219	2536	3055	3098	-0736	3253	0526	1438
63	9040	1255	1011	0686	1245	0827	0896	0092
64	8930	0349	0572	1452	0567	-0010	1380	0528
65	8954	0255	0743	1463	1220	0350	0658	0394
66	7808	3197	1392	1632	0738	2191	0825	-0673
67	7914	3193	1256	0669	0314	1786	0582	-0278

Note: Decimal points omitted

(5)

Factor Loadings After Varimax Rotation

Student Satisfactoriness

Variable	Factor 1	2	3	4	5	6	7	8
68	7791	2238	2081	0673	0403	1957	1221	-0341
69	3481	4405	2091	3657	0751	2581	1644	-0279
70	2977	7352	2104	3571	0950	2744	0896	-0280
71	2555	6770	2743	2579	1878	2500	0882	1059
72	0647	6325	3462	2042	2371	1671	0328	1499
73	2292	7828	2470	1954	1773	1755	1074	0458
74	2377	6005	1922	3823	-0059	3014	0859	-1132
75	2197	7325	3072	2137	1738	2353	1632	0190
76	2687	7489	2965	2485	1445	1324	1251	0216

Note: Decimal points omitted

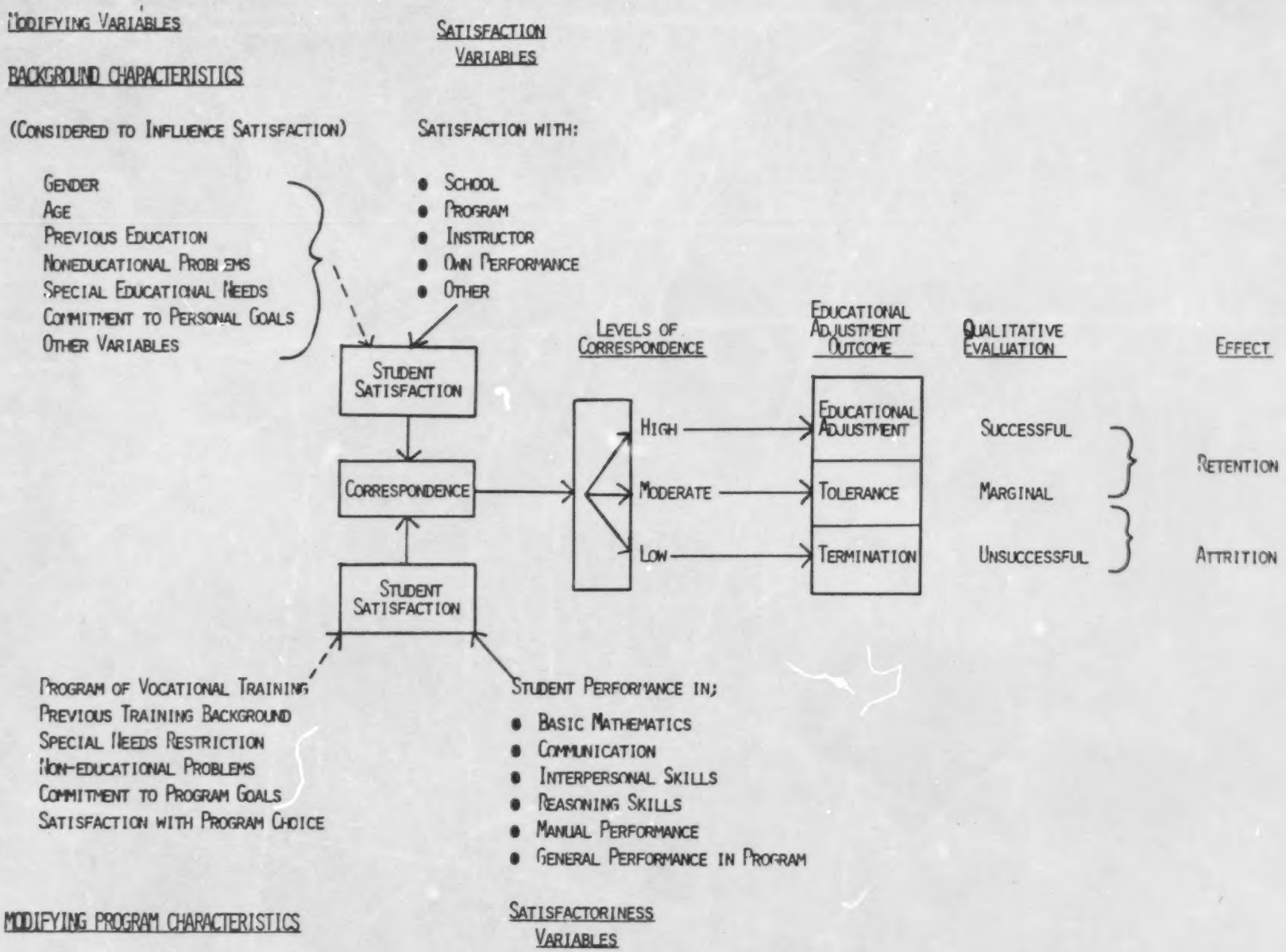

FIGURE 1

CONCEPTUAL SCHEMA OF EDUCATIONAL ADJUSTMENT

Table 1
Student Characteristics by Program

Variable o categories	Accounting N=22	Auto N=28	Ag. Const. N=6	Fabrics N=7	Gun-smithing N=28	Welding N=5	Total N=96
Sex							
• Males	7	28	5	0	28	5	73
• Females	15	0	1	7	0	0	23
Marital Status							
• Single	14	21	6	4	20	3	68
• Married	4	3	0	3	8	2	20
• Other	4	4	0	0	0	0	8
Financial Aid Received**							
• Not Listed	7	13	0	4	4	0	27
• Job	2	7	2	0	0	0	11
• Social Service Agency	4	2	0	0	1	0	7
• Military	1	1	0	0	7	2	11
• Home/Work Study	0	2	1	1	5	1	10
• None	0	1	2	1	10	2	16
• More than 2 Sources	8	3	1	1	1	0	14
Special Needs Category++							
• None	16	28	6	7	24	4	85
• Handicapped	0	0	0	0	2	0	2
• Disadvantaged Academic	0	0	0	0	0	0	0
• Disadvantaged Economics	6	0	0	0	0	1	7
• L.E.P.	0	0	0	0	0	0	0
Special Needs Checked++							
• None	19	27	3	5	23	5	83
• General Learning Problem	0	0	1	0	0	0	1
• Reading	0	0	0	0	1	0	1
• Math	0	1	0	1	0	0	2
• Health	0	0	0	0	1	0	1
• Drugs	0	0	2	0	0	0	2
• Transportation	1	0	0	0	0	0	1
• Hearing Problems	1	0	0	0	0	0	1
• Vision Problems	0	0	0	0	0	0	0

Table 1 (Continued)
Student Characteristics by Program

Variable o categories	Accounting N=22	Auto N=28	Ag. Const. N=6	Fabrics N=7	Gun-smithing N=28	Welding N=5	Total N=96
Special Needs Checked++ (cont'd.)							
• Physical Problems	0	0	0	0	0	0	0
• Interpersonal	0	0	0	0	0	0	0
• Financial Aid	1	0	0	1	2	0	4
• Learning Disability	0	0	0	0	0	0	0
Previous Vocational Training							
• Yes	6	8	3	1	6	0	24
• No	15	18	3	6	21	5	68
Highest Grade Completed++							
• 10	0	5	0	1	0	1	7
• 11	1	2	0	0	2	0	5
• 12	17	19	6	5	23	3	73
• 13	4	0	0	1	0	0	5
• 14	0	0	0	0	1	0	1
• 15	0	0	0	0	1	0	1
• 16	0	0	0	0	1	0	1
• 16 plus	0	0	0	0	0	0	0
Income (Family)							
• Less than 3,000	1	1	0	2	1	0	5
• 3,000 tp 5,000	0	2	0	0	1	0	9
• 5,000 to 8,000	4	3	0	1	5	1	14
• 8,000 to 12,000	1	6	1	0	1	0	9
• 12,000 to 15,000	1	5	0	0	3	1	10
• More than 15,000	4	3	5	0	8	0	26
• Not Specified	11	8	0	4	9	3	34
Mean Age	23.09	23.50	19.53	21.28	26.32	20.80	23.66
Mean Math Scores**	44.5	23.95	36.5	35.85	34.81	19.0	23.12
Mean Reading Score							
• Vocabulary	39.5	35.95	39.33	37.85	40.22	35.75	38.39
• Comprehension*	38.56	34.04	34.66	36.57	38.18	34.50	36.51

++ Not tested for significance
* $p < .05$
** $p < .01$

Appendix B
(1)

Factor Loadings After Varimax Rotation

Student Satisfaction

Variable	Factor 1	2	3	4	5	6	7	8
6	-1583	0733	.0250	-0366	-0842	6730	-0946	1334
7	-0796	0868	1352	-0650	1182	5684	1444	-2157
8	2579	0462	-0780	1416	-0547	5597	0543	0552
9	4800	1566	0221	2017	2387	-2320	1917	0929
10	5592	1732	0569	3054	3086	-0212	0360	2815
11	3244	-0767	-0041	4912	1769	1454	1317	0539
12	1954	-530	0739	7862	0821	-0729	-0030	-0372
13	2511	-1197	0896	7727	2674	-0121	0743	0489
14	5220	-1679	0271	3465	0175	1031	0217	0573
15	4016	2624	-0383	2396	7260	-0331	0402	0535
16	3691	1579	0183	3090	6755	0290	0055	-0778
17	7764	2511	-0006	0798	0127	0219	0660	0275
18	7797	1745	0038	1744	3524	0156	0513	-0086
19	5123	5524	0008	1495	0264	0692	-0831	3737
20	7939	0320	0800	2128	2109	-1210	1840	1585
21	4466	1451	-1055	1357	2946	-1645	0973	1882
22	9064	0948	0264	0220	1344	0066	0096	0345
23	8791	1076	0175	0011	1797	0175	-0295	-0187
24	8163	1958	-0382	0707	0194	0009	1440	0230
25	8133	1060	0217	1307	2353	-0931	0368	1074
26	7989	2985	-0918	0832	-0262	0561	0642	-1240
27	8397	0863	0440	0890	1897	0206	0770	0928

Table 2

Reliability Analysis - Satisfactoriness Questionnaire
Analysis of Subscales by Aggregate and Program

	N	Internal Consistancy Cronbach's Alpha				Stability Pearson's Product Market			
		Time 1	Time 2	Time 3	Time 4	Time 1-2	Time 2-3	Time 3-4	Time 1-4
Total	96	≠ .85	≠ .85	≠ .84	≠ .87	r = .77	r = .74	r = .79	r = .53
Program 1	22	.53	.75	.75	.69	.74	.62	.66	.59
Program 2	28	.88	.88	.88	.95	.88	.91	.86	.84
Program 3	6	.95	.96	.96	.93	.93	.96	.96	.97
Program 4	7	.93	.94	.94	.92	.93	.99	.97	.84
Program 5	28	.85	.83	.83	.89	.73	.58	.76	.29
Program 6	5	.74	.69	.69	.90	.43	.80	.94	.86

Reliability Analysis of Scales
Using Aggregate Data

	N	Internal Consistancy				Stability			
		Time 1	Time 2	Time 3	Time 4	Time 1-2	Time 2-3	Time 3-4	Time 1-4
Scale A	11	.95	.95	.96	.96	r = .67	r = .73	r = .72	r = .42
Scale B	10	.96	.96	.96	.96	.61	.69	.66	.41
Scale C	10	.90	.90	.90	.94	.77	.68	.70	.58
Scale D	7	.96	.96	.96	.97	.60	.59	.66	.54
Scale E	6	.60	.82	.87	.93	.66	.65	.83	.42
Scale F	5	.95	.94	.94	.96	.63	.67	.67	.60
Scale G	4	.92	.92	.93	.91	.70	.74	.72	.36

Table 2

Reliability Analysis - Satisfactoriness Questionnaire
Analysis of Subscales by Aggregate and Program

	N	Internal Consistancy Cronbach's Alpha				Stability Pearson's Product Market			
		Time 1	Time 2	Time 3	Time 4	Time 1-2	Time 2-3	Time 3-4	Time 1-4
Total	96	.85	.85	.84	= .87	r = .77	r = .74	r = .79	r = .53
Program 1	22	.53	.75	.75	.69	.74	.62	.66	.59
Program 2	28	.88	.88	.88	.95	.88	.91	.86	.84
Program 3	6	.95	.96	.96	.93	.93	.96	.96	.97
Program 4	7	.93	.94	.94	.92	.93	.99	.97	.84
Program 5	28	.85	.83	.83	.89	.73	.58	.76	.29
Program 6	5	.74	.69	.69	.90	.43	.80	.94	.86

Reliability Analysis of Scales
Using Aggregate Data

	N	Internal Consistancy				Stability			
		Time 1	Time 2	Time 3	Time 4	Time 1-2	Time 2-3	Time 3-4	Time 1-4
Scale A	11	.95	.95	.96	.96	r = .67	r = .73	r = .72	r = .42
Scale B	10	.96	.96	.96	.96	.61	.69	.66	.41
Scale C	10	.90	.90	.90	.94	.77	.68	.70	.58
Scale D	7	.96	.96	.96	.97	.60	.59	.66	.54
Scale E	6	.60	.82	.87	.93	.66	.65	.83	.42
Scale F	5	.95	.94	.94	.96	.63	.67	.67	.60
Scale G	4	.92	.92	.93	.91	.70	.74	.72	.36

Table 3

Reliability Analysis - Satisfaction Questionnaire
Analysis of Subscales by Aggregate and Program

Groups	N	Internal Consistancy Cronbach's Alpha Time 1	Internal Consistancy Cronbach's Alpha Time 2	Stability Pearson's Product Market Time 1-2
Total	96	.47	.40	r=.72
Program 1	22	.53	.37	.65
Program 2	28	.53	.51	.87
Program 3	6	.68	.67	.91
Program 4	7	.40	.64	.83
Program 5	28	.40	.36	.51
Program 6	5	.74	.84	.22

Reliability Analysis of Scales
With Aggregate Data

Scale	N of Items	Internal Consistancy Time 1	Internal Consistancy Time 2	Stability Time 1-2
Scale A	21	.95	.96	r=.77
Scale B	5	.83	.79	.37
Scale C	6	.83	.87	.43
Scale D	3	.92	.80	.61
Scale E	3	.59	.51	.52
Scale F	3	.66	.63	.35

Table 4

Satisfactoriness Questionnaire
Relationship Between Factors and Internal Reliability

Aggregate Data

Factor	Name	Number of Items	Cronbach's Alpha	Factor Loadings
A	Visible Skills	11	.95	.58, .47, .48, .57, .52, .90, .89, .78, .79, .77
B	Reasoning/Maturity	10	.96	.44, .73, .67, .63, .78, .60, .73, .74, .38, .42
C	General Class Performance	10	.90	.21, .71, .63, .53, .57, .74, .74, .48, .68, .57
D	Communication Skills	7	.96	.78, .71, .73, .56, .68, .56, .74
E	Math Skills	5	.94	.93, .77, .86, .80, .73
F	General Program	6	.87	.57, .84, .71, .64, .74, .59
G	Conformance	4	.93	.75, .81, .85, .89

Table 5

Satisfaction Questionnaire
Relationship Between Factors and Internal Reliability

Aggregate Data

Factor	Name	Number of Items	Cronbach's Alpha	Factor Loadings
A	Instructor Influence	21	.95	.48, .55, .52, .40, .36, .77, .77, .51, .79, .44, .90, .87, .81, .81, .79, .83, .75, .72, .67, .62, .51
B	General Skill Competence	5	.83	.55, .72, .71, .74, .64
C	Own Performance	6	.83	.82, .78, .73, .73, .67, .71
D	School Support System	3	.92	.49, .78, .79
E	Affective/ Interrelations with others	3	.66	.14, .54, .79
F	Conformance (Attendance, etc.)	4	.59	.67, .56, .55

Table 6

Proportions of Variance Accounted for
Using Different Regression Models

Satisfaction

	Criterion: Pictures Being Employed	Overall Satisfaction
Full Regression Model* All Variables	R^2=.4338	R^2=.7321
Reduced Model-Gender	R^2=.4338	R^2=.7304
Reduced Model-Program	R^2=.3657	R^2=.7303
Reduced Model-Aptitude Scores	R^2=.4101	R^2=.7215
Reduced Model-Demographics	R^2=.2281	R^2=.6451
Reduced Model-Scales	R^2=.2572	R^2=.2776

Full Regression Model

$y = a + b$, Scale 4A + b_2, Scale 4B + b_3, Scale 4C + b_4, Scale 4D + b_5, 4E + b_6, Scale 4F + b_7, Age + b_8, Sex + b_9, Financial Aid + b_{10}, Special Needs + b_{11}, Marital Status + b_{12}, Highest Grade + b_{13}, Previous Vocational Training + b_{14}, Income + b_{15}, Math Score + b_{16}, Reading Score C. + b_{17}, Reading Score V. + b_{18} Program

Reduced Model,-Gender = All above variables except sex category

Reduced Model,-Program = All variables of full model except program category

Reduced Model,-Aptitude score = All variables of full model except math, reading score C, and reading score V.

Reduced Model,-Demogrpahics = All variables of full model except variables age through income inclusive

Reduced Mode,-Scales = All variables of full model except variables scale 4A to Scale 4F inclusive

Table 7

Proportions of Variance Accounted for
Using Different Regression Models

Satisfactoriness

	1. Overall Performance	2. Likelyhood of Mastery	3. Grasped Program Content	4. Grade in course to date
Full Regression Model* All Variables	R^2=.8308	R^2=.7140	R^2=.5911	R^2=.4157
Reduced Model-Gender	R^2=.8068	R^2=.7044	R^2=.5863	R^2=.4123
Reduced Model-Program	R^2=.8274	R^2=.6990	R^2.=5872	R^2=.3994
Reduced Model-Aptitude Scores	R^2=.8207	R^2=.7056	R^2=.5846	R^2=.4143
Reduced Model-Aptitude Scores	R^2=.7767	R^2=.6640	R^2=.5504	R^2=.3756
Reduced Model-Scales	R^2=.1747	R^2=.2145	R^2=.1925	R^2=.1648

Full Regression Model

$y = a + b$, Scale 5A + b_2, Scale 5B + b_3, Scale 5C + b_4, Scale 5D + b_5, Scale 5E + b_6, Scale 5F + b_7, Scale 5G + b_8, Age + b_9, Sex + b_{10}, Fiancial Aid + b_{11}, Special Needs + b_{12}, Marital Status + b_{13}, Highest Grade + b_{14}, Previous Vocational Training + b_{15}, Income + b_{16}, Math Score + b_{17}, Reading Score C. + b_{18}, Reading Score V. + b_{18} Program

Reduced Model,-Gender = All above variables except sex category

Reduced Model,-Program = All variables of full model except program category

Reduced Model,-Aptitude score = All variables of full model except math, reading score C, and Reading Score V.

Reduced Model,-Demographics = All variables of full model except variables age through income inclusive.

Reduced Model,-Scales = All variables of full model except variables scale 4A to scale 4F inclusive

Table 8

Correlations and Intercorrelations of Scales
Satisfactoriness Questionnaire

Based on Aggregate Data

	A	B	C	D	E	F	G
A	.622	674	593	675	412	372	283
B	638	.617	724	692	337	585	207
C	526	678	.776	705	621	577	404
D	525	741	565	.608	502	624	301
E	333	497	562	539	.666	458	371
F	492	595	538	609	432	.631	222
G	354	417	533	401	420	356	.703

Main diagonal are correlations between time 3 and 4

Top right are intercorrelations at time 3

Bottom left are intercorrelations at time 4

N= 96

Table 9

Correlations and Intercorrelations of Scales
Satisfaction Questionnaire

Based on Aggregate Data

	A	B	C	D	E	F
A	.778	.032	.548	.467	.070	.405
B	.059	.376	.125	.079	-.103	.286
C	.596	.201	.432	.048	.164	.457
D	.612	.153	.349	.616	.067	.294
E	.108	.102	.243	.033	.529	.135
F	.523	.045	.425	.478	-.038	.355

Main diagonal are correlations between time 1 and 2

Top right are intercorrelations at time 2

Bottom left are intercorrelations at time 1

N= 96

Table 10

Relationship Between Levels of Demographic Variables
With Total Score on Satisfaction and
Satisfactoriness Scales

Aggregate Date

Demographic Variables	Satisfaction Scale	Satisfactoriness Scale
Age	N.S.	N.S.
Sex	F=3.13 p < .05	N.S.
Marital Status	N.S.	F=3.15 p < .05
Ethnic	Not Tested	Not Tested
Financial	N.S.	N.S.
Special Needs	N.S.	N.S.
Highest Grade	F=2.54 p < .05	N.S.
Previous Vocational Training	N.S.	N.S.
Income	N.S.	N.S.
Special Needs	N.S.	N.S.
Vocational Program	F=6.51 p < .001	N.S.
Ability Measures		
Math	N.S.	F=2.09 p < .05
Reading Vocabulary	N.S.	N.S.
Reading Comprehension	N.S.	N.S.
Grade for Course	F=2.52 p < .05	F=7.08 p < .001
Commitment		
Absense	N.S.	F=4.42 p < .001
Tardiness	N.S.	F=15.65 p < .001
Leave Early	F=2.62 p < .05	F=10.56 p < .001
Late From Breaks	N.S.	F=9.68 p < .001

	High	Low	
High	N=11	N=1	12
Low	N=7	N=3	10
	18	4	

Program 1

	High	Low	
High	N=17	N=7	24
Low	N=2	N=2	4
	19	9	

Program 2

	High	Low	
High	N=3	N=1	4
Low	N=0	N=2	2
	3	3	

Program 3

	High	Low	
High	N=3	N=1	4
Low	N=3	N=0	3
	6	1	

Program 4

	High	Low	
High	N=2	N=9	11
Low	N=7	N=10	17
	9	19	

Program 5

	High	Low	
High	N=4	N=1	5
Low	N=0	N=0	0
	4	1	

Program 6

Figure 2

Contingency Tables of Each Program

Row = Satisfaction variable
Column = Satisfactoriness variable

Table 11

Analysis of Correlation Between the Two Instruments of Satisfaction and Satisfactoriness

Aggregate Data

Pearson's Correlation of Total Scores

R = .114 N = 96 Sig. .25 (N.S.)

Canonical Correlation

Satisfaction Scales with Satisfactoriness Scales

Can Cor	Equilvant	Can Cor	Wilks L.	X^2	d.f.	Sig.
1	.357	.598	.487	63.56	42	.017
2	.133	.356	.759	24.39	30	.754
3	.058	.242	.875	11.73	20	.925
4	.041	.202	.930	6.35	12	.897
5	.024	.156	.970	2.64	6	.852
6	.005	.076	.994	.46	2	.792

Table 12

Descriptive Statistics for Both Scales

	Satisfaction Scale Total	Satisfactoriness Scale Total
Mean	104.04	121.69
Standard Deviation	23.13	27.88
Standard Error	2.361	2.84
Skewness	0.329	0.074
Curtosis	-0.133	0.249
.95 c.i. interval	99.35 to 108.731	116.04 to 127.34

APPENDICES

A: Student Satisfaction Questionnaire, Factor/Item Relationship

Student Satisfactoriness Questionnaire, Factor/Item Relationship

B: Factor Loadings After Varimax Rotation-Student Satisfaction

Factor Loadings After Varimax Rotation-Student Satisfactoriness

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